

FEASIBILITY STUDY

**NC 8, From I-85 to NC 49
Davidson County
R-2300**

**Prepared by
Planning and Research Branch
Division of Highways
N. C. Department of Transportation**

April, 1988

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I. DESCRIPTION

This report covers a preliminary study of the proposed improvement of the subject road for a distance of approximately 24.3 miles. This project is included in the 1988-1996 Transportation Improvement Program for feasibility study and/or right of way protection. It is not currently funded. Location of the project is shown on the attached map.

II. PURPOSE OF PROJECT

Existing Road Characteristics

The entire studied section of road is designated as a major collector in the proposed Davidson County Thoroughfare Plan. It provides an important connection between an Interstate route and a principal arterial and affords access to recreational areas of High Rock Lake.

From the existing four-lane divided section at I-85 to the High Rock Lake bridge just south of Southmont, the existing roadway along NC 8 has generally 22 to 24-foot pavement with 3 to 5-foot shoulders. However, south of the lake crossing, the existing road narrows to 18 to 20-foot pavements with variable shoulder widths of 2 to 6 feet. Since few right of way agreements are available, the existing right of way is estimated to be 40 feet, the ditch to ditch width maintained by NCDOT.

The existing alignment of NC 8, constructed through rolling terrain, is generally fair. Most of the curves and grades are within the desirable 55 MPH design speed, 6-degree curve criterion. There are 6 curves ranging from 7 to 12 degrees, but most of them are located in areas where the speed limit has been reduced. Safe passing distance is restricted to appropriately 25 percent of the total project length. Little, if any, realignment would be expected in the improvement of this road.

Four concrete bridges are located along the subject road. They are as follows:

<u>Bridge No.</u>	<u>Location</u>	<u>Date Built</u>	<u>Length</u>	<u>Width</u>	<u>Sufficiency Rating</u>
83	W-S Railway	1986	181'	30'	80.0
59	Arm of High Rock Lake	1981	295'	40'	90.4
48	Flat Swamp Creek	1976	140'	40'	99.1
31	Lick Creek	1947	151'	24'	52.8

From I-85 to about halfway between NC 47 and Cotton Grove, roadside development consists of heavy density mixed uses, including businesses, residences, a church, a school, industries, and a fire station. Speed

limit through this area is 45 MPH. On the remaining section to the first crossing of High Rock Lake, NC 8 is fronted by mostly residences of light to medium density, except through the Southmont community where more residential and commercial development occur. Speed limit through this area is 35 MPH. South of High Rock Lake to NC 49, land use is primarily woodland with sparse development. Except for those mentioned above, the overall speed limit is 55 MPH.

NC 8 is paralleled by Winston-Salem Railway from I-85 to High Rock Lake near Southmont. The railway is close to the highway at several locations and crosses the highway at one point located at Southmont. This crossing involves 2 trains per day and is protected by flashers and gates. A spur of the Winston Salem Railway crosses NC 8 south of NC 47 to serve a large industry and is also protected by flashers and gates.

Only one traffic signal exist along the entire studied length. The lone signal is located at the intersection of NC 47.

Traffic Volumes, Capacity, and Accident History

Current traffic volumes along NC 8 are approximately 12,000 vehicles per day between I-85 and NC 47, 3000 to 6000 vpd between NC 47 and Southmont, and 800 to 1500 vpd between Southmont and NC 49. Estimated traffic volumes for year 2008 are 20,000 vpd, 5000 to 9000 vpd, and 1400 to 2500 vpd, respectively. Approximately 5 percent of the total traffic volume consists of heavy trucks.

At desirable level of service C in rural areas, capacity along the existing two-lane facility is approximately 5000 vpd. In suburban areas where level of service D would be appropriate, capacity is approximately 8000 vpd. Thus, in comparing capacity with actual traffic demands, only the section between I-85 and NC 47 is experiencing severe capacity deficiency.

A total of 268 accidents were reported on this portion of NC 8 during a recent 3½-year period. More than half of this total occurred on a 3-mile section between I-85 and the Cotton Grove area. The accident rate in this area nearly equalled the 1986 statewide average rate of 2.0 accidents per million miles for two-lane NC routes. Major accident patterns are rear-end collisions and run-off-road types. The accident rate for the remaining section of road to NC 49 was about 0.8 acc/mvm.

Need For Project

The studied project has varying deficiencies which warrant improvements. Portions of the project require additional lanes to provide capacity and congestion relief and other portions require wider lanes and shoulders for safety and maintenance reasons. Improvements to this facility are commensurate with design standards desired for the function and volume of traffic the route serves.

III. RECOMMENDATIONS AND COSTS

Recommended improvements are as follows:

From I-85 to NC 47 (1.5 Miles)

Widen to a 64-foot curb and gutter section. Widening would be asymmetrical to minimize right of way costs. Estimated right of way width is 80 feet plus easements where necessary. The proposed five-lane width is necessary to adequately and more safely accommodate present and future traffic volumes and separate congestive left turning traffic from through traffic. Curbing should be used to minimize costs of acquiring additional right of way through dense roadside development with limited setbacks.

From NC 47 to School Entrance Just South of SR 1272 (1.8 Miles)

Widen to 40-foot pavement with 6-foot soil shoulders. The pavement would be marked as three 12-foot lanes and a 2-foot paved shoulder on each side. Widening would generally be symmetrical, except at locations where it should be asymmetrical to minimize right of way costs and/or avoid encroachment on the railroad. Estimated right of way width is 80 feet plus easements where necessary. Basis for recommending this cross section is a combination of frequency of intersecting roads, magnitude of roadside development, volume of traffic using this section of road, and accident experience. The addition of a continuous center lane would provide refuge for left-turning traffic and help maintain through traffic capacity.

From School Entrance to High Rock Lake Bridge (6.6 Miles)

Widen to 28-foot pavement with 6-foot soil shoulder. The pavement would be marked as two 12-foot lanes and a 2-foot paved shoulder on each side. Widening would generally be symmetrical, unless asymmetrical widening is necessary to reduce right of way costs and/or avoid railroad encroachment. Estimated right of way width is 70 feet plus easements where necessary. This widening is designed to increase safety and decrease maintenance of shoulders and would tie in with the wide soil and paved shoulders provided on the causeway approaches to the High Rock Lake Bridge. The only exception to this recommendation is a 0.9-mile section through the Southmont community where use of a three-lane, 40-foot curbed section is prudent because of the density, type, and proximity of roadside development. Estimated right of way width in this area is 55 feet plus easements where necessary.

From High Rock Lake Bridge to NC 49 (14.3 Miles)

Widen to 26-foot pavement with 4-foot soil shoulders. The pavement would be marked as two 11-foot lanes and a 2-foot paved shoulder on each side. Widening would generally be symmetrical. Estimated right of way width is 70 feet plus easements where necessary. The proposed widening would improve safety by

correcting the substandard pavement and shoulder widths and reduce potential maintenance problems and total shoulder width. Since traffic volumes are lower on this section of road, lane width and total shoulder width are logically reduced to 11 feet and 6 feet, respectively.

The only bridge improvements involved with this project would be the widening of the bridge over the Winston-Salem Railway and in-kind replacement of the bridge across Lick Creek. The remaining bridges would be retained without improvements.

The total estimated cost of the improvements outlined above is \$13,700,000 including \$7,800,000 for roadway construction, \$900,000 for structures, and \$5,000,000 for right of way. Cost estimates were furnished by the Design Services Unit and Right of Way Branch. If staging of the project is desired, the following priorities are suggested:

Priority 1, I-85 to NC 47 (1.5 miles)

Roadway	\$1,700,000
Structures	500,000
Right of Way	<u>1,950,000</u>
Total	\$4,150,000

Priority 2, NC 47 to High Rock Lake (8.4 miles)

Roadway	\$2,750,000
Structures	0
Right of Way	<u>1,450,000</u>
Total	\$4,200,000

Priority 3, High Rock Lake to NC 49 (14.3 miles)

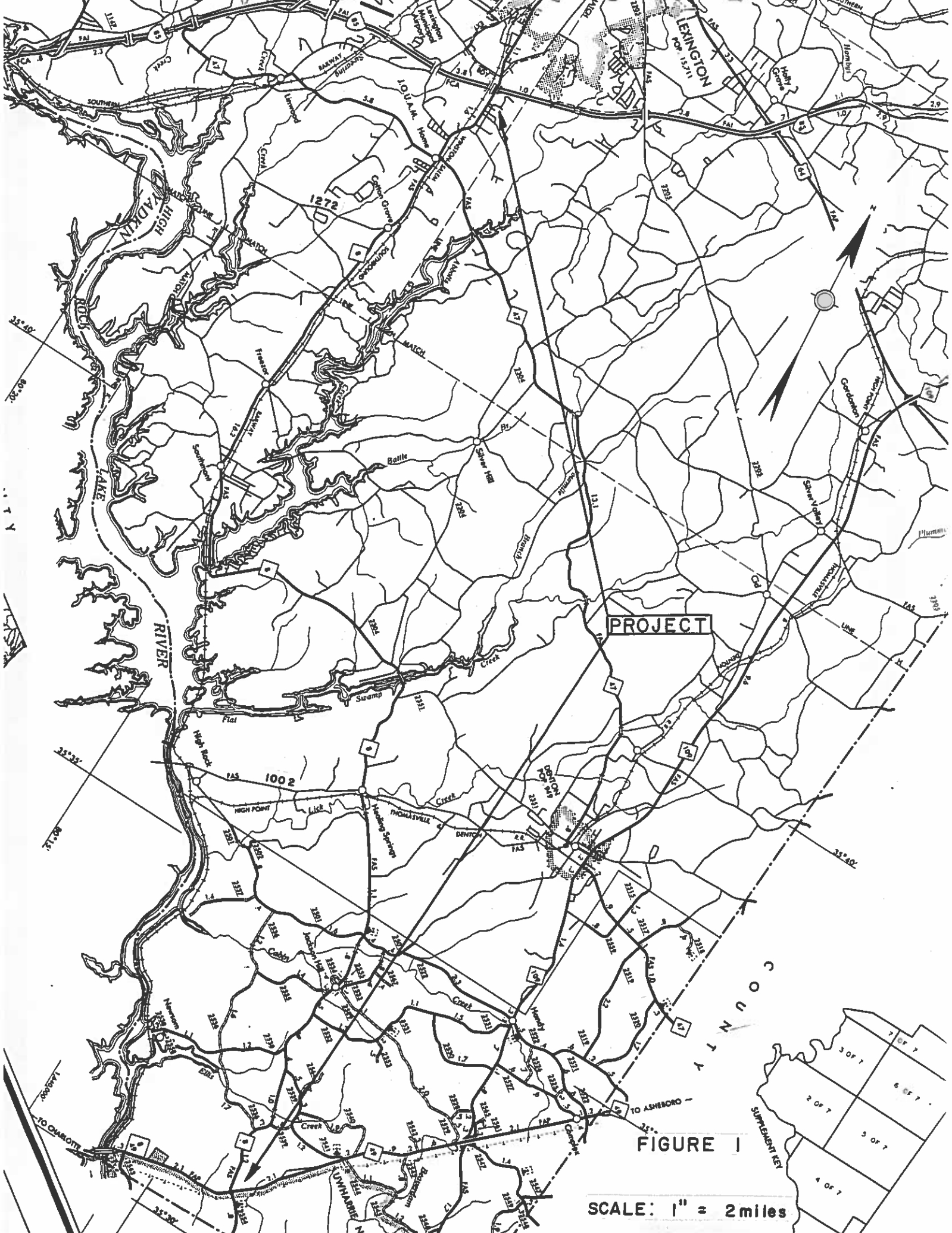
Roadway	\$3,300,000
Structures	400,000
Right of Way	<u>1,650,000</u>
Total	\$5,350,000

IV. OTHER COMMENTS

No other alternatives were considered for this project.

Negative environmental impacts of the recommended improvements are: (1) loss of land required for additional right of way; (2) displacement of one business; (3) loss of some wildlife habitat; (4) possible siltation of a water supply lake and streams crossed by the project; and (5) increased noise levels for residences adjacent to the highway.

Local government should be encouraged to ensure that any new development planned along this road is adequately set back from the road to allow the recommended widening.



PROJECT

FIGURE 1

SCALE: 1" = 2 miles

